

DIY autoloaders



DIY Autoloader

by: DCEM

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introduction

When archiving my CD collection I had enough change CDs sometime so much on my nerves, that I decided to kill this problem technically.

For "old" version, there is a [YouTube video](#)

The concept appealed to me so much that I wanted to publish an open source variant thereof. However, there were under the open source aspect of some weaknesses in the design, so I built a second one.

The newer version, although already very different from the "old", but the basic operating principle has remained the same.

[YouTube video](#) of the new version. In Video my development and demonstration can be seen. There are slight changes.

The autoloader sets a new medium as soon as the computer opens the drive. For this purpose, no special driver is required.

Personal motivation

- nerves Optical media (OM)
 - Collections encompass many media 100
 - scratch OM
 - Space and weight are in no reasonable relationship to the amount of data
- Commercial solutions are expensive (about)
- Previous DIY solutions are too large, too costly

Demands on my DIY solution

- inexpensive
- space-saving
- quickly built up
- easily recreate
- Open source
- Om change without driver-based communication with the computer

realization

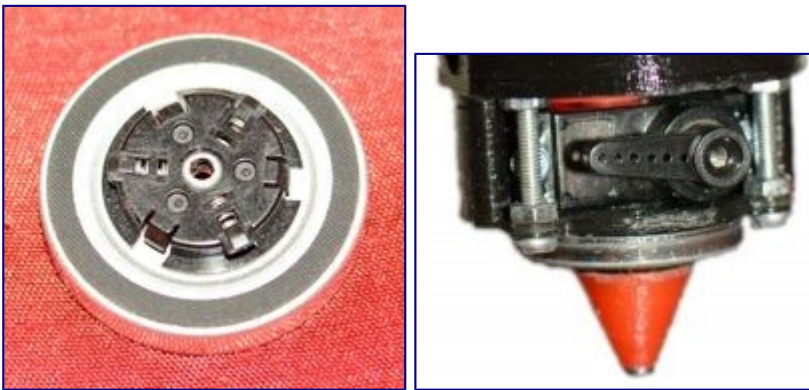
Mechanical construction

There should be as many components as possible "recycled", which saves time and money.

Complex mechanical parts are designed as 3D printing parts.

OM Claw

The associated pickup tool there ready in notebook drives. (Left) In order for this gripper can operate automatically, you have to provide him with a centering cone and a mechanism for stripping the OM. (right)



OM-moving - Crane

Since it is necessary to grasp the OM with the selected pickup tool about 1kg must be based on the OM, is selected as the approach a crane. This has the decisive advantage that it can affect not use excessive force on the OM by design. A counterweight is present, can be dispensed with a self-locking drive.

When the weights is weight plates (three 0.5kg), these are cheap, rotationally symmetric and have a hole in the middle. :)

The spring above the gripper ensures that one turns off the weight of a blow to the OM. Once the spring is somewhat relieved triggers a reed contact. The position to cancel out of the magazine is not previously clear here helps the reed contact.

A microswitch informs whether a medium is currently in the gripper.

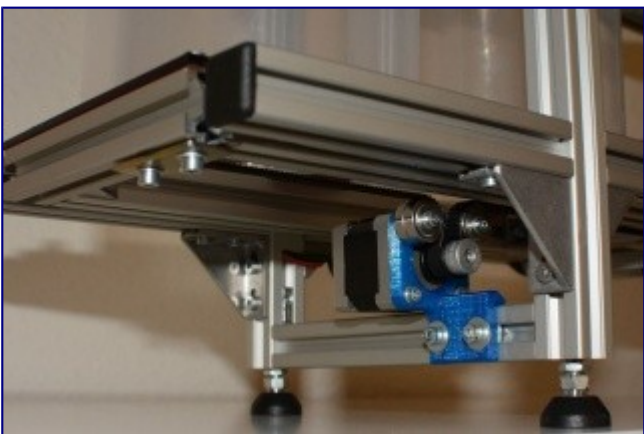
The change to a toothed belt to a counterweight (Vormodell self-locking worm gear motor) provides the following benefits: After a limit switch (low-cost), the position is always known, which accounts previously used 10-gangpoti (rather expensive). If something goes wrong slipping the timing belt simply by having one of the weight is off. Here I was able to all the "paranoia electronics" of the previous model without contraceptives.

OM-gripper (left); Crane driving + counterweight (right)



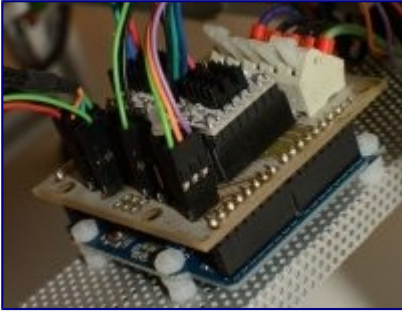
OM magazine

These are also available fortunately finished. Two pieces of a row in a drawer, in one of them another hole and finished :)

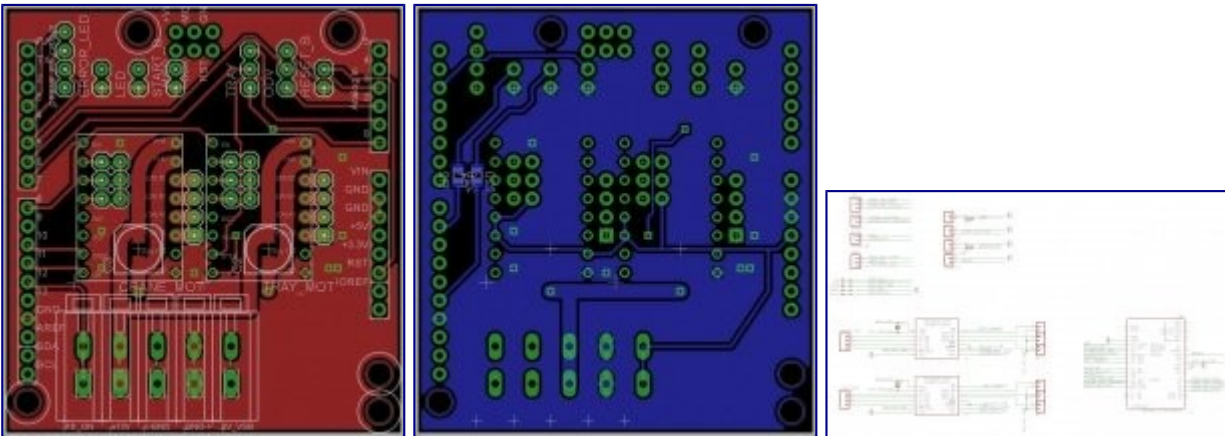


electronics

Arduino + Autoloader Shield + 2 X Pololu - A4988 (stepper motor driver):



The autoloader Shield was created using Eagle:



Eagle files: [File: Autoloader-Shield.zip](#)

Parts list, files, software etc.

software

Arduino source code: [File: Autoloader-source-code.zip](#)

I have to drive with acceleration the [AccelStepper](#) Posted -Library. Always nice when it already what feriges are :)

AutoIT script dBpoweramp: [file: AutoIT-Script-dBpoweramp.zip](#)

to be machined components

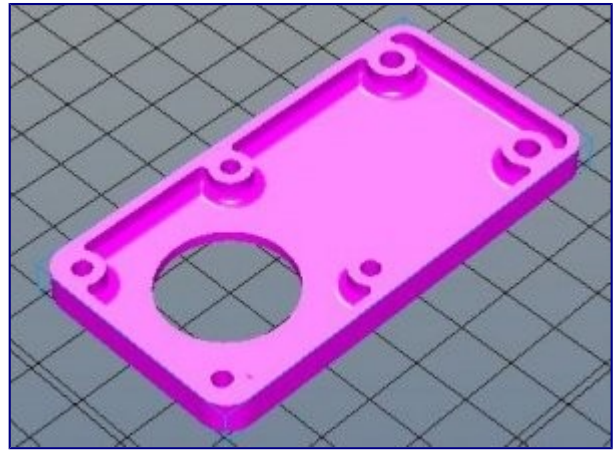
3D printing parts

designation	number	file	image
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Motorhalter
crane drive

1

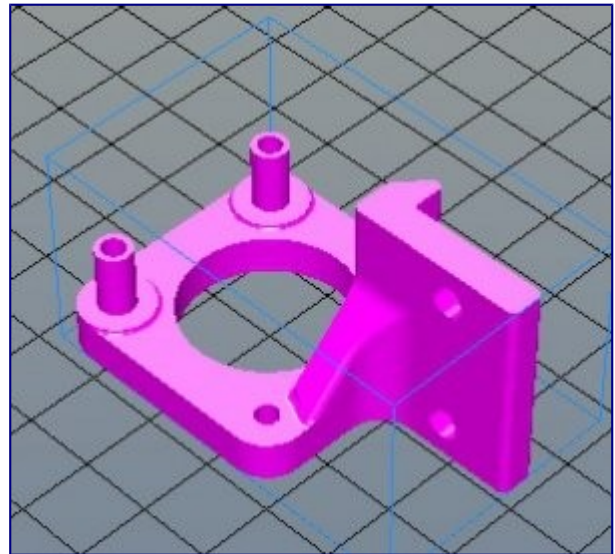
[File: Motor Holder
Kranantrieb.stl](#)



Motorhalter
magazine drive

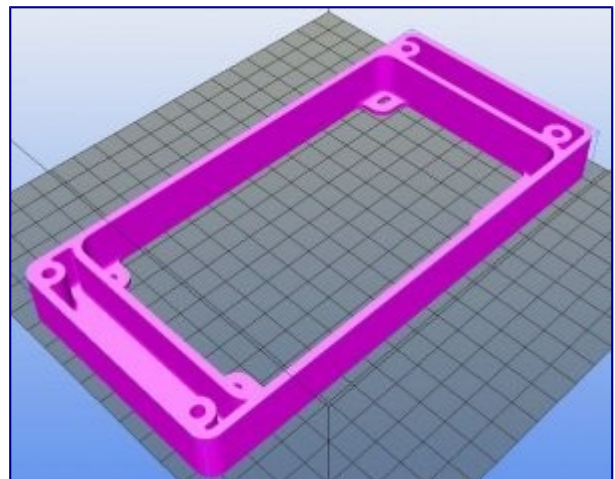
1

[File: Motor Holder
Magazinantrieb.stl](#)



PSU holder

1 [File: Netzteilhalter.stl](#)



OM Claw - Pickup
tool holder

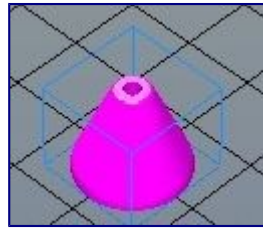
1

[File: OMG-Pickup Tool
Halter.stl](#)



OM Claw -
centering

1 [File: OMG
Zentrierhilfe.stl](#)



OM Claw -
intermediate bracket 1

1 [File: OMG Interim Holder
1.stl](#)



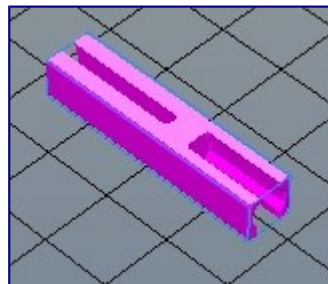
OM Claw -
intermediate bracket 2

1 [File: OMG Interim Holder
2.stl](#)



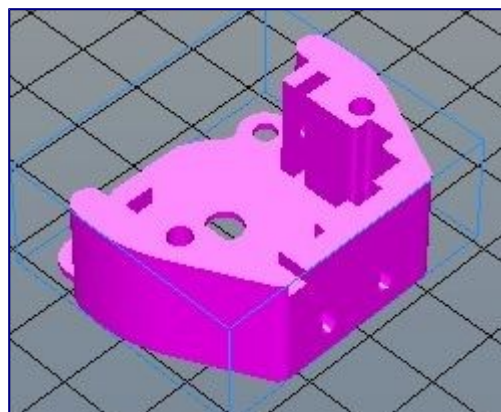
OM Claw - Reed
contact holder

1 [File: OMG
Reedkontakthalter.stl](#)



OM Claw -
Servohalter

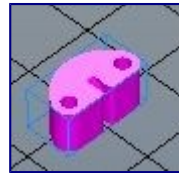
1 [File: OMG Servohalter.stl](#)



OM Claw - toothed blocks spring

1

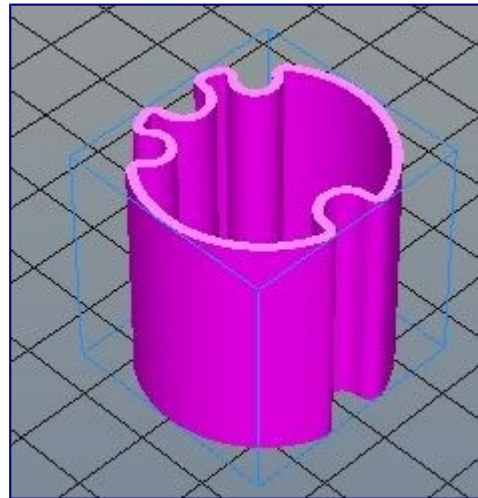
[File: OMG-toothed blocks-Feder.stl](#)



OM-gripper centering weights

1

[File: OMG-centering-Gewichte.stl](#)



Timing blocks Weight

2

[File: Timing blocks-Gewicht.stl](#)



Others

designation	number	source	file
Aluminium angle 50X10X2:		Hornbach	
Bracket drive (90mm)	2		File: Bracket Laufwerk.svg
Bracket crane limit switch (40mm)	1		File: Bracket Limit Switch Kran.svg
Bracket Arduino - 1 (180mm)	1		File: Bracket Arduino 1.svg
Bracket Arduino - 2 (180mm)	1		File: Bracket Arduino 2.svg
Autoloader Shield	1		File: Autoloader-Shield.zip

Finished components

designation	number	source	Order no.
5.25 OM drive	1		
ATX - power supply	1		
Pickup Tool	1	old notebook - drive	
Spring RZ-069CX	1	Gutekunst springs	RZ-069CX
Magnet 8x2	1	supermagnete	S-08-02-N
100 Spindle cover	2	ISP Proshop	731
500g weight	6	Sport -Tiedje	TC0050
Ball bearing slide 246mm 10kg	2	Beschaege-Online	1017246
SMD Elko Longlife 100uf 16v 105 °	2	Voelkner	W59386
Spring terminal Ak3001 Rm5,0 gray 5-pole	5	Voelkner	D29637
SMD resistor 0805 Rc 2012 220r 1% 0.125W	2	Voelkner	W17611

Pin header 1x36 pin plated Rm 2.54	2	Voelkner	D19990
Receptacle 1x36 plated Rm 2 54	1	Voelkner	D17886
spiral cable	1	Voelkner	R55804
Mini servo WG 90mg	1	Voelkner	A70766
Micro switch	2	Voelkner	D72409
Micro switch	1	Voelkner	D72435
Leaded Reed Sensor PIC MS-104-3	1	Voelkner	S78083
Thrust washer 14 mm 8 mm 0.3 mm)	4	Voelkner	A43983
Cable ties 100mmx2,5mm Black	10	Voelkner	S20638
Slotted cheese head screws - M2 x 20	1	Voelkner	C66848
Slotted countersunk head screws - M4 x 6	8th	Voelkner	S59495
Plastic bolt 1xinnen 1xausseng M3x10	8th	Voelkner	S21410
Washers DIN 9021, polyamide - 3.2mm for M3	12	Pegnitz screws	9021903
M3 nut - polyamide	4	Pegnitz screws	934 5 03
Slotted cheese head screws M3 x 8 polyamide	4	Pegnitz screws	12073008
Head screws with hexagon socket - M5 x 65mm	2	Pegnitz screws	3912 05 065
M8 threaded rod 170mm	2	Pegnitz screws	976 1 1 08
Slotted cheese head screws - M2 x 10	6	Pegnitz screws	5675 020 010
Slotted cheese head screws - M2 x 12	6	Pegnitz screws	5675 020 012
Slotted cheese head screws - M2 x 6	2	Pegnitz screws	5675 020 006
Slotted cheese head screws - M3 x 25	4	Pegnitz screws	5675 030 025
Hex nuts - M2	14	Pegnitz screws	934 1 02
Hex nuts - M3	10	Pegnitz screws	934 1 03
Hex nuts - M5	3	Pegnitz screws	934 1 05
Hex nuts - M8	12	Pegnitz screws	934 1 08
Head screws with hexagon socket - M3 x 10	6	Pegnitz screws	3912 03 010
Head screws with hexagon socket - M3 x 20	2	Pegnitz screws	3912 03 020
Head screws with hexagon socket - M4 x 10	2	Pegnitz screws	3912 04 010
Head screws with hexagon socket - M4 x 12	2	Pegnitz screws	3912 04 012
Head screws with hexagon socket - M4 x 25	4	Pegnitz screws	3912 04 025
Head screws with hexagon socket - M4 x 6	8th	Pegnitz screws	3912 04 006
Head screws with hexagon socket - M4 x 8	84	Pegnitz screws	3912 04 008
Head screws with hexagon socket - M5 x 50	1	Pegnitz screws	3912 05 050
Washers - M2	24	Pegnitz screws	125 1 22
Washers - M3	8th	Pegnitz screws	125 1 32
Washers - M4	32	Pegnitz screws	125 1 43
Washers - M5	6	Pegnitz screws	125 1 53
Washers - M8	8th	Pegnitz screws	125 1 84
Diameter washer M8 25x1.5	4	Pegnitz screws	3275 0080 0250
P20-N6-B 130 mm	2	Motedis	
P20-N6-B 490 mm	2	Motedis	
P20-N6-B 410 mm	2	Motedis	
P20-N6-B 151 mm	5	Motedis	

P20-N6-B 340 mm	2	Motedis
P20-N6-B 509 mm	1	Motedis
P20-N6-B 131 mm	1	Motedis
P20-N6-B 260 mm	2	Motedis
P20-N6-B 128 mm	1	Motedis
P20-N6-B 490 mm	2	Motedis
P20-N6-B 60 mm	2	Motedis
Hinged. Number 10. Polyamide 25 M6x20	3	Motedis
Interior angles zinc diecasting 20 B-type groove 6	4	Motedis
Connector plate 20x40 (Motedis)	2	Motedis
Angle 20 B-type groove 6	11	Motedis
Angle 20x40 B-type slot 6	12	Motedis
Profilabdeckkappe 20 B-type groove 6	8th	Motedis
Node plate aluminum plated 60x60	4	Motedis
Anodised aluminum angle 20x20	2	Motedis
Hammer nut B-type groove 6 / M4	108	Motedis
Arduino	1	MANUPOOL
Power Stage	2	MANUPOOL
Timing tray	1	MANUPOOL
Zanhriemen crane	1	MANUPOOL
Nema 17 42BYGHW811	1	MANUPOOL
timing pulley T2,5-18-2	2	MANUPOOL
Nema 14 SM35HT44-02	1	MANUPOOL
625-SKF Bearings	4	MANUPOOL
608-2Z-SKF Bearings	2	MANUPOOL

license

The Arduino source code is available under GPL V2. This is because, that I [AccelStepper](#) use -Library. For further information see [AccelStepper link](#)

For the rest applies: This work is licensed under a [Creative Commons Attribution - Share Alike 3.0 Unported license](#) .

To do

Should there be interest in this project I would make a detailed building instructions and explanation.

Currently, there is rarely a problem in that the gripper transports two OM. This goes unnoticed by the autoloader.

Cause: In the upper medium the ring on the underside has failed too small. The discs sticking

adhesive.

To this end, I have an idea to solve the problem. I want to recognize with a retro-reflective sensor if I transport one or two media.

Alternatively, one could think of an ultrasonic detection.

Category :

- [projects](#)

